

Algebra 2 - Composition and Inverse Functions - Worksheet

Common Core F-BF.A.1c, F-BF.B.4a · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice composition and inverse functions (Common Core F-BF.A.1c and F-BF.B.4a). The first problems check evaluating compositions from equations and tables, the middle problems add finding and verifying inverses, including restricted domains, and the last six are word problems and multi-step tasks that need temperature, taxi fare, and discount problems.

Work in order and show every step. Write each answer in simplest form, and open the answer key only after you have tried the problem yourself.

Algebra 2 · Common Core State Standards: **F-BF.A.1c, F-BF.B.4a**

Exercise 1 - Evaluate a composition

Let $f(x) = 2x + 3$ and $g(x) = x^2$. Find $f(g(2))$ and $g(f(2))$.

Exercise 2 - Compose expressions

Let $f(x) = x + 4$ and $g(x) = 3x$. Find $f(g(x))$ and $g(f(x))$. Are they equal?

Exercise 3 - Compose from tables

x	1	2	3
g(x)	4	1	2

Values of g.

x	1	2	4
f(x)	5	0	7

Values of f.

Use the tables to find $f(g(1))$, $f(g(2))$, and $f(g(3))$.

Exercise 4 - Composition with a radical

Let $f(x) = \sqrt{x-1}$ and $g(x) = x^2 + 1$. Find $f(g(x))$ and simplify.

Exercise 5 - Domain of a composition

Let $f(x) = \frac{1}{x-2}$ and $g(x) = x+3$. Find $f(g(x))$ and state its domain.

Exercise 6 - Inverse from a table

x	1	2	3	4
f(x)	7	10	13	16

Values of f.

The table shows a linear function f . Write $f(x)$, find $f^{-1}(x)$, and use it to find the input that gives an output of 25.

Exercise 7 - Inverse with a fraction

Find the inverse of $f(x) = \frac{x+5}{2}$, then verify by composition.

Exercise 8 - Inverse of a cube

Find the inverse of $f(x) = x^3 + 1$.

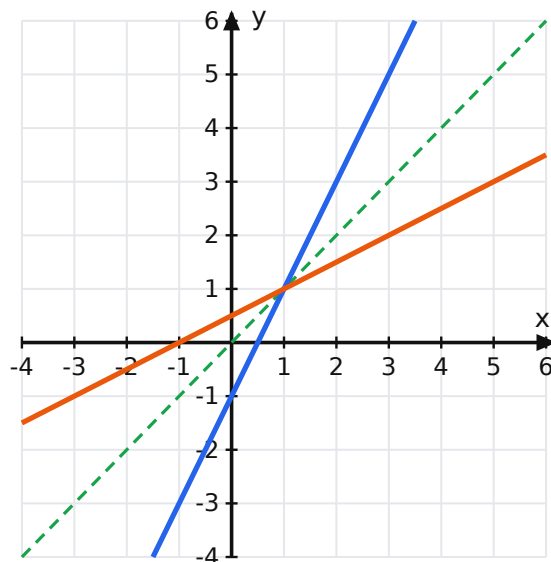
Exercise 9 - Inverse of a rational function

Find the inverse of $f(x) = \frac{2}{x-1} + 3$.

Exercise 10 - Verify inverses

Show that $f(x) = 4x - 8$ and $g(x) = \frac{x+8}{4}$ are inverses.

Exercise 11 - Read the graph



f in blue, f^{-1} in orange.

The graphs of $f(x) = 2x - 1$ and its inverse are shown. Find $f^{-1}(3)$ from the graph and by algebra.

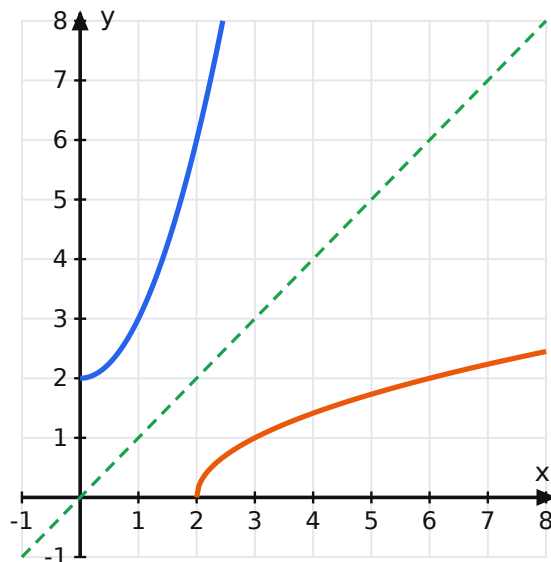
Exercise 12 - Inverse of a table

x	-2	0	1	4
$f(x)$	5	3	2	-1

Values of f .

The function f is one-to-one. Make a table for f^{-1} and find $f^{-1}(2)$.

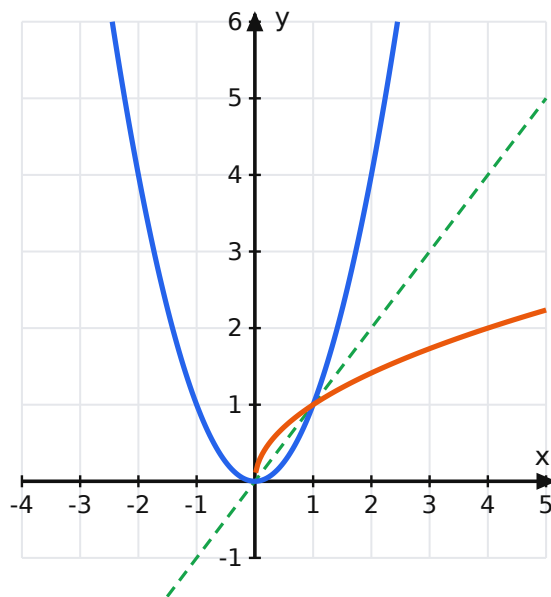
Exercise 13 - Restricted quadratic



f and its inverse.

Find the inverse of $f(x) = x^2 + 2$ for $x \geq 0$ and state its domain.

Exercise 14 - Why no inverse?



A horizontal line meets the parabola twice.

Explain why $f(x) = x^2$ has no inverse function over all real numbers. Give two inputs with the same output.

Exercise 15 - Vertex form with a restriction

Find the inverse of $f(x) = (x-3)^2 - 1$ for $x \geq 3$.

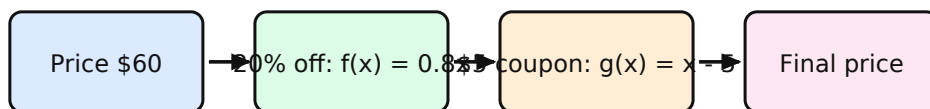
Exercise 16 - Temperature

The formula $F = \frac{9}{5}C + 32$ converts degrees Celsius to Fahrenheit. Find the inverse formula and use it to convert 86°F .

Exercise 17 - Taxi fare

A taxi's fare in dollars is $c(m) = 3 + 2.5m$ for m miles. Find the inverse and use it to find how many miles Priya can ride on an \$18 budget.

Exercise 18 - Order matters



Discount and coupon.

A store gives a 20% discount, $f(x) = 0.8x$, and a \$5 coupon, $g(x) = x - 5$. Compare $g(f(60))$ (discount first) and $f(g(60))$ (coupon first). Which order gives the lower price?

Exercise 19 - Growing circle

A circular ripple has radius $r(t) = 3t$ inches after t seconds, and its area is $A(r) = \pi r^2$. Write the area as a function of time and find the area at 2 seconds.

Exercise 20 - Find the error

Noah says the inverse of $f(x) = 2x + 1$ is $\frac{1}{2x+1}$. Use $f(3)$ to show that he is wrong and find the correct inverse.

Exercise 21 - Find the outer function

If $g(x) = x + 2$ and $f(g(x)) = x^2 + 4x + 7$, find $f(x)$.